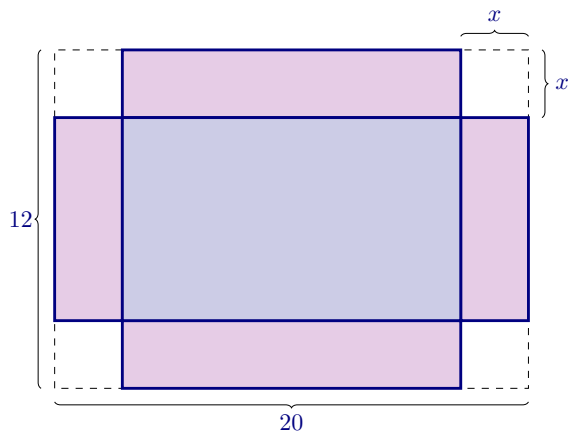


Exercise 1 A box with an open top is to be constructed from a rectangular piece of cardboard with dimensions 12 cm by 20 cm by cutting out equal squares of side x at each corner and then folding up the sides:



Express the volume V of the box as a function of x . (In factored form)

$$V(x) = \boxed{x(20 - 2x)(12 - 2x)}$$

Feedback(attempt): When folded up, what is the width of the box in terms of x ? The length? The height?

Exercise 2 Multiply out your answer above:

$$V(x) = \boxed{4}x^3 + \boxed{-64}x^2 + \boxed{240}x$$

Exercise 3 If x increases in value from 1 to $(1+h)$, by how much will volume of the box change? Simplify.

$$V(1+h) - V(1) = \boxed{4}h^3 + \boxed{-52}h^2 + \boxed{124}h$$

Hint: You found $V(x)$ above. Plug in $x = 1 + h$ and $x = 1$, then subtract and simplify.